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CAMBODIA, LAOS, THAILAND AND VIET-NAM

Committee for Co-ordination of Investigations
of the Lower Mekong Basin.

PROGRESS REPORT 1962

French Sedimentation Mission

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FRENCH SEDIMENTATION MISSION

PROGRESS REPORT

for 1962

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The French Sedimentation Mission has been installed since 15 January 1962, when the Mission Sedimentologist arrived. The Hydrologist arrived at the end of February.

1.- WORKING CONDITIONS.-

A.- SEDIMENTATION LABORATORY.-

a)- PREMISES

As a purely unofficial measure, the Service des Pêches of Cambodia made available to the French Sedimentation Mission premises it had in the building of the Ecole Royale d'Administration at Chak-Angré. These premises, which were partly equipped as a laboratory (laboratory benches, hood) have been reconditioned, as well as the equipment made available to the Mission.

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b)- EQUIPMENT

The equipment used by the Sedimentation Mission for the year under review comes from two sources:

- equipment loaned by the Institut Piscicole (drying-closet, scales, sampling bottles).
- equipment purchased by the Mission from French Assistance funds.

The latter includes some simple laboratory equipment (sieves, cupels) and field equipment (boats, motors, drills, earthgrab, Ph.meter, thermo-sounding devices).

Further laboratory equipment (a machine of the Rotap type) has been received.

c)- PERSONNEL

In addition to the Mission Sedimentologist, the sedimentation laboratory personnel now includes one technical assistant and three Cambodian trainees, assigned by the Government services to which they belong to the French Mission. They receive a technical assistance training at the laboratory and a field training (navigation, samplings), as well as a preparation to office activities (computation, drawing).

d)- ACTIVITIES

The Sedimentation Laboratory which has been operating since June has so far limited its activity to a summary examination of the samplings and drilling cores taken during the year by the Sedimentation Mission. The

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methods chiefly used to-date are: description, log, underwater sifting, water-contents, particle-size study, sediment transport, calcimetry.

Special studies requiring either specialized equipment or specialized technicians will be made in France (heavy minerals, densimetry, dehydratometry).

The idea has not been to create a highly specialized installation, but to lay the foundation for a laboratory that might subsequently be expanded should the investigations being conducted so require or the Cambodian Government so desire.

B.- COOPERATION WITH THE CAMBODIAN GOVERNMENT SERVICES.-

For the preparation of the hydrologic appraisal required by the sedimentation survey, we are cooperating closely with the Arrondissement de l'Hydraulique et de la Navigation of the Public Works Department.

We thus trained the personnel required for the survey, so far three teams numbering altogether nine workers.

The hydrometric equipment utilized in the course of this year was that of the French Sedimentation Mission.

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II.- MATERIAL COLLECTED DURING THE CURRENT YEAR.-

A.- GEOLOGY.-

The geology of the region under consideration was studied from two different angles:

1°/- Lithology of the Drainage Areas

A number of surveys conducted around the Great Lake as well as on the drainage areas of the tributary stungs of the Great Lake enabled us to study the different geological and pedological aspects of those regions.

Samplings of rocks and soils were taken for mineralogic and particle-size study. In this manner, the drainage areas of the Great Lake have been divided in a number of groups according to whether the rivers which drain them are transporting sand, or not.

2°/- Quaternary history of the Great Lake Basin

Several surveys, one of which was made with Professeur SAURIN, enabled us to make cross-sections in the continental formations of Cambodia. This study which we expect to continue next year is aimed at giving us stratigraphic landmarks in the quaternary history of the region. These landmarks we shall endeavour to relate to our investigations in the matter of lakes.

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B.- HYDROLOGY AND SEDIMENTATION APPRAISAL.-

1.- Meteorology.

The meteorological data concerning the Great Lake Basin are given us by the Service Météorologique du Cambodge.

The evaporometric network had to be completed by two floating stations (pans) and 15 Piche stations.

2.- Gaging Stations.

The gaging network of the Great Lake Basin currently comprises 45 gaging stations, four of which are equipped with recording systems; one of these was installed in the middle of the Lake at 11 Kilometers from Kompong-Luong.

- 85% of the gaging stations have been installed or reinstalled during this year by the Arrondissement de l'Hydraulique et de la Navigation.
- 30% of the stations are currently controlled by the Nivellement Général Khmère; the others will be in the course of the dry season.

3.- Measurement of Liquid Discharge and Rating.

Twenty-three streamgaging stations are distributed around the Great Lake, enabling us to control, in addition to the outflowing and inflowing water-courses, 75% of the Great Lake Basin upstream of R.N.5 and R.N.6.

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In connexion with two of these stations, installed by Harza, a rating was established and is being completed by us: the TONLE-SAP at PREK DAM and the STUNG SEN at KOMPONG-THOM.

For the rating of the other stations, 125 streamgaging measurements, made during the last rainy season, are available.

4.- Sediment Transport.

Approximately two thousand water samplings for the study of sediment transport were made with every streamgaging measurement, and every time the stations for which a rating-curve already existed were visited; a total of 135 measurements of average solid sediment transport in suspension in the sections.

C.- PHYSICO-CHEMICAL STUDY OF THE WATER.-

Three different aspects of the problem were studied during the current year:

1)- Distribution of the water at high stage periods in the vicinity of the "Seuil de Snoc-Trou." This study enabled us to follow the mixing process of the waters of the Tonlé Sap and Stung Sen as they enter the Lake, on the surface as well as below.

2)- Variations of the physico-chemical characteristics of the water of the Great Lake during first 36 hours' uninterrupted observation at high stage period.

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3)- Systematic measurement of free iron ions in the tributary stungs of the Great Lake according to the same sampling programme as for the solid discharge in suspension, and measurement of the same free ion in the Lake at regular intervals. This investigation will enable us to summarily appraise the amount of free iron contained as a solution in the Lake Basin. We realized that free iron ions were playing an essential part in the sedimentation of chemical origin of lake clays.

In addition to such specific studies, we also made during our surveys a number of observations in the field of temperature, pH, turbidity, etc. which enabled us to clarify a number of problems.

D.- CORE-DRILLINGS.-

Two types of core-drillings were made:

Small core-drillings made with a collapsible hand-drill. About forty locations have been investigated in this way during the period under review.

All these samplings were studied at the laboratory to an extent commensurate with the equipment and the laboratory personnel described above.

Large core-drillings. For the campaign of large core-drillings, we had to fit out at a ten meter junk boat. It was equipped with a five-meter "bigue"

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(jib installed in front), a hand windlass, a Zullig-type sounding-apparatus, three anchors and an outboard motor. This type of craft has the advantage of having a shallow draught (forty centimeters) which enables it to be used at low-water stage and makes it fairly stable when not in motion. The sampling campaign which began at the end of August produced twenty cores evenly distributed on the surface on the Great Lake.

The laboratory processing for ten of these samples was conducted along the same lines as for the small ones. All were opened, described and the water contents determined. Altogether over 30 meters of large core-drillings were studied.

These drillings enabled us to ascertain the comparative homogeneousness of the cross-sections obtained. The pattern of a stratigraphy of recent quaternary sediments could thus be established. No sedimentation of rythmic type was reveled and so far analysis results gave no indication of such sedimentation pattern.

Along with this drilling campaign, samples of surface sediments were taken whenever deemed necessary. In this field too, as far as lake conditions are concerned, the homogeneousness of surface sediments is, from a macroscopic viewpoint, rather remarkable. Analyses are being conducted; they will reveal whether that homogeneousness still prevails under more minute observation (heavy minerals, iron ...)

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III.- PROSPECTS FOR 1963.-

In 1963, the French Sedimentation Mission expects to continue and expand its programme of hydrology and, in connexion with it, its programme for the study of solid discharge. This programme has been outlined in a previous report.

As far as the study of solid sediment transport goes, the Sedimentation Mission has during the current year given consideration to the problem and thinks of building a sedimentation pit on a sand-transporting stung, according to the results of preliminary experiments.

The sedimentation survey will be continued on the Great Lake according to the data gathered in the course of the current year; investigations will be extended to the Veal Pok area, south of the Seuil of Snoc-Trou. The same applies to geological surveys.

The physico-chemical study of the water will be carried out according to the programme described above; in addition, a study will be made of the waters of the Tonle Sap at high-stage period between Prek Dam and Snoc Trou.